IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF OKLAHOMA

STATE OF OKLAHOMA, *et al.*,	
Plaintiffs,	
v.	
	Case No. 4:05-cv-00329-GKF-SAJ
TYSON FOODS, INC., *et al.*,	
Defendants.	

Fourth Declaration of Dr. Victor J. Bierman, Jr.

1. My name is Victor J. Bierman, Jr. I am currently a senior scientist with LimnoTech, an environmental consulting firm specializing in water quality issues and water system modeling. I have been retained by the Defendants in this matter to analyze and respond to the Plaintiffs' modeling of the Illinois River Watershed ("IRW").

2. I have previously submitted three declarations in this matter. My training and experience in environmental modeling is set out in those declarations.

3. In my previous declarations, I explained that Plaintiffs' experts, Drs. Engel and Wells, base their expert reports on the results of several working models of the IRW and Lake Tenkiller. These working models consist of not just computer programs, but of the associated input files, output files and data files that, taken together, embody the complete set of results put forth in Drs. Engel's and Wells' expert reports.

4. In connection with Drs. Engel's and Wells' reports, Plaintiffs have produced a large number of individual computer programs, input files, output files and data files. However, as I explained in my previous declarations, it appeared that several key files were missing from that production. As a result of the deficiencies in Plaintiffs' production, we have not been able to reproduce or analyze the complete set of results contained in Drs. Engel's and Wells' expert reports.

5. I also previously explained that, on June 18, 2008, Plaintiffs provided additional information about Dr. Wells' model. Among other information, Plaintiffs stated that "Run143 was the run used in the Wells' Expert Report." Yet, even using this specific information, my team and I were still unable to reproduce the results contained in Dr. Wells' report. Upon further investigation, my team and I determined that the results in the model output files produced by Dr. Wells for "Run143" do not match the results in his expert report.

6. In light of these conflicting results, I asked for Plaintiffs to provide a step-by-step protocol for reproducing all of the results in Dr. Wells' and Dr. Engel's reports using the materials produced by the Plaintiffs.

7. On July 10 and 11, I and my staff participated in conference calls with Drs. Wells and Engel, respectively. In those calls, we asked Drs. Wells and Engel to walk through the process of assembling their models from the materials the Plaintiffs had produced.

8. In those telephone conferences, Drs. Wells and Engel stated that Plaintiffs had failed to produce several files for each of their respective models. These missing files are essential to assembling the models in such a way as to reproduce the results in their expert reports. In addition, some of the information that Plaintiffs had previously provided in response to our questions was incorrect. For example, Dr. Wells stated that Plaintiffs had erred in telling us that "Run 143" corresponded to the results in his expert report, and that in fact "Run 200" corresponds to the results in his expert report.

9. Dr. Wells identified the following essential files that were missing from Plaintiffs' previous production:

   - The CE-QUAL-W2 water level calibration input/output and post-processing files.
   - The input/output and post-processing results files for Scenario 5 (Growth conditions) as described in Table 12 of Dr. Wells' expert report.
   - The input/output and post-processing results files for Scenario 6 (Historical conditions with hydrology from 1950-1999) as described in Table 12 of Dr. Wells' expert report.

10. Since the call with Dr. Wells, Plaintiffs have produced these missing files.

11. Dr. Engel identified the following essential files that were missing from Plaintiffs' previous production:

    - The input and output files for the results of the GLEAMS hydrology calibration for Caney Creek shown in Figure 9, Appendix D, of Dr. Engel's expert report.
    - A subdirectory named "Second Stage" under \Engel\Materials\1GLEAMS. This subdirectory contains GLEAMS input and output files for hydrology and nutrients, executables, and batch files. The subdirectory "Second Stage" contains separate subdirectories for Baron Fork and the Illinois River. It may also contain a third separate subdirectory for Caney Creek, but this needs to be confirmed.
    - A file containing GLEAMS model outputs for daily total phosphorus loads for the base period (1997-2006).
    - A file named "Lake.zip" is in the directory Engel\Materials\p_data. This file contains a program (Shuffled Complex Evolution Algorithm) used to produce the coefficients

a, b and c, and Paccumulation in the phosphorous routing model. There should be three separate files corresponding to the USGS gauging stations at Tahlequah, Baron Fork and Caney Creek. The location to which the file "Lake.zip" corresponds could not be determined. The files for the other two locations could not be found. The location to which the file "Lake.zip" corresponds needs to be determined and the files for the other two locations need to be found or produced.

12. Dr. Engel also indicated that there should be routing model spreadsheets for each of the nine scenarios conducted with his GLEAMS and routing models. We are still trying to determine whether all of these spreadsheets are included in the materials produced to date by Plaintiffs.

13. In addition, Dr. Engel could not clarify during the call the order of execution of the following two files for the GLEAMS hydrology calculations: (1) GLMEAMS301.EXE; and (2) SCEGLEAMS.EXE, but agreed to do so in writing after the call.

14. Finally, Dr. Engel provided several corrections or clarifications during the call. First, a file that Plaintiffs produced on June 26 contained the spreadsheet "routing.xls" for the phosphorus routing model. The file "routing.xls" is not the correct version. Second, Dr. Engel stated during the call that the units for phosphorus loading in "p_model.xls" are labeled incorrectly. They should be in kg/day not lbs/day.

15. Plaintiffs have not yet produced the missing files from the Engel production or the follow-up information Dr. Engel committed to send.

16. To date, the effort of trying to reproduce and analyze Plaintiffs' models and results has consumed a great deal of time and expense. My team and I have spent seven weeks working to assemble these models and reproduce the results in Plaintiffs' expert reports. Much of this was wasted effort. Without the missing files, we never could have correctly assembled Plaintiffs' models and reproduced Plaintiffs' results. Moreover, the incorrect information that Plaintiffs provided in response to our questions consumed additional time and effort as we attempted to understand why the models would not work as Plaintiffs represented. We have spent over 890 hours on this work since Plaintiffs' produced their models, and now must replicate much of that work.

17. I and my staff are just now beginning the process of assembling Dr. Wells models with the files Plaintiffs produced following our teleconference. We will diligently work to assemble Dr. Engel's models once Plaintiffs produce the missing files. After the models are assembled, I and my staff will need the several months of time discussed in my first declaration to test all of the assumptions and data built into the models.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed on July 14, 2008